

"SUGARING" IN THE AUTUMN.

BY RUDOLF C. B. BARTSCH,
Roslindale, Mass.

Of the many methods employed in collecting Lepidoptera there is none, which has been tried in this country, that has given poorer results than the so-called "sugaring." European collectors come here with tales of phenomenal luck in collecting moths by means of "sugar," especially members of the family Noctuidæ. Upon consulting Mr. William Reiff, I found that the methods of the German entomologists vary so greatly from those recommended by American authors that it seemed to me this must be the reason for the extraordinary results. Mr. Reiff agreed to accompany me and give this method a trial after I had explained to him my previous unsuccessful attempts to secure anything worth while by means of "sugar."

The first difference that I found was in the "sugar" used, and the second in the manner of applying to the trees. Holland, for instance, in his "Moth Book"¹ recommends on page 146, the following formula: 4 lbs. sugar, 1 bottle of stale beer and a little rum, to be placed in a bucket and applied to the trees with a whitewash brush. This mixture naturally gives a very thin solution and soaks readily into the bark of the trees, and since he recommends a whitewash brush it is supposed that he is desirous of covering a large area quickly. The formula given me by Mr. Reiff is as follows: 1 quart cheapest molasses, to which add about one half a bottle of stale beer and then boil until it nearly stiffens when dropped in cold water. Let it cool and then add about a wine-glass full of Jamaica rum. This mixture should be prepared some days in advance as aging seems to improve it. This "sugar" is enough for three trips and gives, each time, enough for from 40 to 50 trees. Just before using add to the mixture necessary for one night, 3 or 4 drops of amyl acetate. The method of applying to the trees is as follows: take a small round brush (about 1 inch diameter) and dip it into the sugar, then cover a space on the bark of the tree about the size of palm of the hand, working

¹Holland, W. J., *The Moth Book*. New York: Doubleday, Page & Co., 1905.

the "sugar" well into the bark, and have it about the height of the shoulders from the ground. The "sugar" being very thick is not easily absorbed by the bark and trickles down very slowly.

The next and most important point is to select a proper place to "sugar." We first tried "sugaring" along the paths of a large wood-lot where the large trees had been thinned out until they were on an average about 10 feet apart. There was, however, very heavy underbrush. The results here were so discouraging that even Mr. Reiff was inclined to admit that "sugaring" in America seemed to be more or less a failure, but he maintained that the place was not ideal, so we hunted for a better spot. Finally we found at Concord, Massachusetts, a large woods in which about eight acres had been thinned out until the large trees were about 8 to 12 feet apart and without underbrush. This place was intersected by several well-worn paths and was surrounded on all sides by dense forest extending for a considerable distance in all directions. The trees have an average diameter of about 8 inches, and are mostly white and red oaks, with a few pines, birches, maples and hickories scattered here and there.

On September 14th we made our first attempt at this place and had such gratifying results that we have been "sugaring" there at least once a week since that time. On no trip have we secured less than fifty specimens each and on October 19th we each secured over 200 perfect specimens of about 30 different species. At all times we made it a point to apply the "sugar" to the trees right after sunset and then waited until it was quite dark (about 20 to 30 minutes after sugaring last tree), before we lighted our "Bullseye" lanterns. The lantern should be held carefully so that the rays of light shine steadily on the trees, for flitting lights and shadows scare the insects from the sugar. Another important point is to approach the sugar directly in front and not from one side. As you approach the tree it is well to notice carefully just what species are resting there, and then try to secure the new and rare specimens first, for at times it is possible to secure only very few of those that are sipping the sweets. Just what causes this restlessness of the insects at times we were unable to determine. October 12th and 19th were two almost identical days, both fairly warm (about 55° in the evening). On the 12th a very heavy fog hung over the land making it difficult at times to distinguish

objects more than 100 feet away, while on the 19th a heavy misty rain was falling, also shutting out the landscape. On both evenings shortly after dark a southwest wind sprung up, clearing the atmosphere and also bringing with it the moth of the "cotton worm," *Alabama argillacea* Hübner, which came freely to our "sugar."

The moths however acted very differently on these two days. On the 12th they rested very quietly on the "sugar" and were not disturbed very much by our approach, so that it was possible to take all the specimens we desired which were there. We were fortunate enough to secure over one hundred, each of us. On the 19th, however, the moths behaved very badly, and if they had not been ten times more numerous than previously I am afraid we would have caught very few of them. They seemed to be swarming about the "sugar" and on one tree I counted over fifty specimens, but I was able to secure less than a dozen on this tree. It was very exciting and interesting to collect as many as ten different species of *Xylina*, with a *Catocala* here and there, also several *Scopelosoma* and many other interesting insects. Besides the moths, we found two species of ants. (*Cremastogaster* sp., and *Lasius niger* var. *americanus*), some Ichneumonidæ and Vespidæ, Coleoptera (mostly Carabidæ Lampyridæ, also Tenebrionidæ), Orthoptera (*Diaperomera femorata* and *Gryllus pennsylvanicus*), Diptera and Myriapoda.

We found on all our trips that the first round of the trees yielded about 70 per cent of our catch, the second round about 25 per cent, and the third round only 5 per cent. Of course the second and third rounds yielded different species from the first, showing conclusively that certain species feed later than others and it is therefore advisable to make several trips in order to secure these different late feeding species. We made a later attempt on the 26th of October after three days of heavy rainfall and found that the moths came quite freely to the "sugar," but only the more common and more numerous species, showing that the rain in all probability had killed them in large numbers or that they were still too weak to fly.

These "sugaring" experiments also gave us some data as to the length of the flying period of some of the *Catocalas*. We had taken *Catocala amica* f. *nerissa*, Hy. Edw., in the middle of July

on the trees in the daytime and found it as late as October 5th on the "sugar." *Catocala concumbens*, Walk., we found the first week in August and as late as the 19th of October, *Catocala cara*, Guen., from the middle of August to the 26th October; *Catocala relicta* f. *phrynia* middle of August to 12th of October; *Catocala antinympha*, Hübn., the middle of July to the first week of October. From these data we decided that the flying period is at the least two and one-half months long.

The following is a list of the species taken which we have so far identified:

Noctuidae.

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| <i>Caradrina multifera</i> Walker. | <i>Xylina innominata</i> Smith. |
| <i>Oligia grata</i> Hübner. | “ <i>laticinera</i> Grote. |
| <i>Hyppa xylinoides</i> Guenée. | “ <i>grotei</i> Riley. |
| <i>Euplexia lucipara</i> Linnæus. | “ <i>antennata</i> Walker. |
| <i>Actinotia ramosula</i> Guenée. | “ <i>tepida</i> Grote. |
| <i>Pyrophila pyramidoides</i> Guenée. | “ <i>baileyi</i> Grote. |
| <i>Heliotropha reniformis</i> Grote. | “ <i>pezata</i> Grote. |
| <i>Prodenia ornithogalli</i> Guenée. | “ <i>thaxteri</i> Grote. |
| “ <i>eudiopta</i> Guenée. | “ <i>petulca</i> Grote. |
| <i>Laphyma frugiperda</i> Abbot & Smith. | “ <i>capax</i> Grote & Robinson |
| <i>Rhynchagrotis rufipectus</i> Morrison. | “ <i>unimoda</i> Lintner. |
| “ <i>placida</i> Grote. | <i>Calocampa nuptera</i> Lintner. |
| “ <i>minimalis</i> Grote. | “ <i>curvimacula</i> Morrison. |
| <i>Adelphagrotis prasina</i> Fabricius. | <i>Jodia rufago</i> Hübner. |
| <i>Semiphora elimata</i> f. <i>janualis</i> Grote. | <i>Eucirradia pampina</i> Guenée. |
| <i>Agrotis badinodis</i> Grote. | <i>Scoliopteryx libatrix</i> Linnæus. |
| “ <i>ypsilon</i> Rottemburg. | <i>Orthosia bicoloraga</i> Guenée. |
| <i>Peridroma margaritosa</i> Haworth. | “ <i>helva</i> Grote. |
| “ “ f. <i>saucia</i> Hübner. | <i>Scopelosoma moffatiana</i> Grote. |
| <i>Noctua bicarnea</i> Guenée. | “ <i>walkeri</i> Grote. |
| “ <i>c-nigum</i> Linnæus. | <i>Glæa inulta</i> Grote. |
| “ <i>plecta</i> Linnæus. | “ <i>sericea</i> Morrison. |
| “ <i>lubricanus</i> Guenée. | “ <i>viatica</i> Grote. |
| <i>Euzoa messoria</i> Harris. | <i>Epiglæa pastillicans</i> Morrison. |
| <i>Anytus privatus</i> Walker. | “ <i>declira</i> Grote. |
| <i>Mamestra trifolii</i> Rottemburg. | <i>Alabama argillacea</i> Hübner. |
| “ <i>renigera</i> Stephens. | <i>Eustrotia apicosa</i> Haworth. |
| <i>Heliphila unipuncta</i> Haworth. | <i>Drasteria crassiuscula</i> Haworth. |
| “ <i>albilinea</i> Hübner. | <i>Catocala insolabilis</i> Guenée. |
| “ <i>multilinea</i> Walker. | “ <i>tristis</i> Edwards. |
| <i>Lithomoia germana</i> Morrison. | “ <i>relicta</i> Walker. |
| <i>Xylina disposita</i> Morrison. | “ “ f. <i>phrynia</i> Hy. Edwards. |

<i>Catocala cara</i> Guenée.	<i>Euparthenos nubilus</i> Hübner.
“ <i>amatrix</i> Hübner.	<i>Parallelia bistriaris</i> Hübner.
“ <i>concupens</i> Walker.	<i>Homoptera lunata (edusa)</i> Drury.
“ <i>groteiana</i> Bailey.	<i>Eipzcuxis americana</i> Guenée.
“ <i>ultronia</i> Hübner.	“ <i>lubricalis</i> Geyer.
“ <i>ilia f. uxor</i> Guenée.	“ <i>denticulalis</i> Harvey.
“ <i>ilia f. osculata</i> Hulst.	“ <i>scobialis</i> Grote.
“ <i>antinympa</i> Hübner.	<i>Plathypena scabra</i> Fabricius.
“ <i>badia</i> Grote & Robinson.	<i>Hypena humuli</i> Harris.
“ <i>amica f. nerissa</i> Hy. Edwards.	

And about 30 to 40 species as yet unidentified.

Geometridae.

<i>Hydriomena latirupta</i>	Walker.
“ “	var.

About a dozen species of the so-called micro-Lepidoptera.

LIMOSINA MIRABILIS COLLIN, A SPECIES OF BORBORIDÆ NEW TO THE UNITED STATES.

BY J. R. MALLOCH AND F. KNAB,
U. S. National Museum, Washington, D. C.



Fig. 1. Hind leg
of *Limosina mirabilis* Collin.

Amongst a miscellaneous lot of Diptera collected at Veitch, Va., on June 9, 1912, there were three specimens of an interesting Borborid. It was originally described by J. E. Collins (Ent. Month. Mag., Vol. 13, 2d ser., p. 59, figs. 5, 6, 1902), from specimens taken by G. H. Verrall at Newmarket, England, and recorded also from Kirtling, England in the same paper. The remarkable thorn on the hind tibia present in both sexes (see fig. 1) readily distinguishes it from any other described species of the genus *Limosina*. The wing has the second and third costal divisions sub-equal.